

CLAIMS

What is claimed is:

1. A centerless ground thermal desorption tube for insertion into a fitting, said centerless ground desorption tube having an outer diameter with a centerless grinding tolerance sufficient to provide a seal with said fitting after insertion into said fitting, said centerless ground thermal desorption tube comprising:

a centerless ground tubular outer barrel which is centerless ground to said centerless grinding tolerance, said centerless ground tubular outer barrel having a first end and an opposing second end;

at least one tubular inner spacer mounted within said centerless ground outer barrel at said first end of said centerless ground outer barrel, said at least one tubular inner spacer being secured to said first end of said centerless ground outer barrel in a manner which does not alter said centerless grinding tolerance so that said first end of said centerless ground outer barrel is insertable into said fitting for providing said seal with said fitting; and

a sorbent material positioned within said centerless ground tubular outer barrel.

2. The centerless ground thermal desorption tube of claim 1 wherein said at least one tubular inner spacer comprises a glass material.

1 3. The centerless ground thermal desorption tube of claim 2 wherein said glass
2 material of said at least one tubular spacer is heated so as to fuse with said first end of
3 said centerless ground tubular outer barrel prior to a centerless grinding process of said
4 centerless ground outer barrel such that said heating and fusing does not affect said
5 centerless grinding tolerance.

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7 4. The centerless ground thermal desorption tube of claim 3 further comprising a
8 second inner spacer comprising glass material, said glass material of said second inner
9 spacer is heated so as to fuse with said first end of said centerless ground tubular outer
10 barrel after said centerless grinding process of said centerless ground outer barrel such
11 that said heating and fusing does affect said centerless grinding tolerance.

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13 5. The centerless ground thermal desorption tube of claim 1 wherein said centerless
14 ground tubular outer barrel is comprised of glass.

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16 6. The centerless ground thermal desorption tube of claim 1 wherein said centerless
17 ground tubular outer barrel and said at least one tubular inner spacer are comprised of
18 glass.

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20 7. The centerless ground thermal desorption tube of claim 1 wherein an outer
21 diameter of said at least one tubular inner spacer and an inner diameter of said centerless
22 ground tubular outer barrel comprise tolerances close enough to provide a friction fit
23 therebetween.

1 8. The centerless ground thermal desorption tube of claim 1 wherein said centerless
2 ground tubular outer barrel is fire polished at least at one end with said at least one
3 tubular inner spacer prior to a centerless grinding process so as to not change said
4 centerless grinding tolerance.

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6 9. The centerless ground thermal desorption tube of claim 1 further comprising at
7 least one of a screen or a glass wool section.

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9 10. The centerless ground thermal desorption tube of claim 1 wherein said at least one
10 tubular inner spacer provides a support for said sorbent material.

- 1 11. A centerless ground thermal desorption tube, said centerless desorption tube
2 having an outer diameter with a centerless grinding tolerance, said centerless ground
3 thermal desorption tube comprising:
4 a centerless ground tubular outer barrel which is centerless ground to said
5 centerless grinding tolerance, said centerless ground tubular outer barrel having a first
6 end and an opposing second end;
7 at least one tubular inner spacer mounted within said centerless ground outer
8 barrel at said first end of said centerless ground outer barrel, said at least one inner spacer
9 being secured to said first end of said centerless ground outer barrel;
10 a sorbent material positioned within said centerless ground tubular outer barrel
11 supported by said at least one inner spacer.
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- 13 12. The centerless ground thermal desorption tube of claim 11 wherein said at least
14 one inner spacer is fused to said centerless ground outer barrel by heating.
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- 16 13. The centerless ground thermal desorption tube of claim 12 wherein said at least
17 one inner spacer is fused to said centerless ground outer barrel before a centerless
18 grinding process of said centerless ground outer barrel which creates said centerless
19 grinding tolerance.
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- 21 14. The centerless ground thermal desorption tube of claim 12 wherein said at least
22 one inner spacer is fused to said centerless ground outer barrel after a centerless grinding

1 process of said centerless ground outer barrel which creates said centerless grinding
2 tolerance.

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4 15. The centerless ground thermal desorption tube of 11, further comprising a first
5 tubular inner spacer mounted within said centerless ground outer barrel at said first end of
6 said centerless ground outer barrel and a second tubular inner spacer mounted within said
7 centerless ground outer barrel at said second end of said centerless ground outer barrel.

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- 1 16. A method for making a centerless ground desorption tube, comprising:
2 inserting a first inner tubular spacer into a first end of a tubular outer barrel;
3 mounting said first inner tubular spacer to a first end of said outer barrel so as to
4 affix said first inner tubular spacer to said first end of said tubular outer barrel;
5 centerless grinding said combination of said first inner tubular space and said
6 outer tubular outer barrel so that said tubular outer barrel is round within a centerless
7 grinding tolerance;
8 inserting sorbent material into said tubular outer barrel through a second end of
9 said tubular outer barrel which is opposite from said first end.
10
- 11 17. The method of claim 16 further comprising mounting said first inner tubular to
12 said first end of said tubular outer barrel by heat fusing said first inner tubular spacer to
13 said first end of said tubular outer barrel.
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- 15 18. The method of claim 16, further comprising mounting a second inner tubular
16 spacer to a second end of said tubular outer barrel after said step of centerless grinding of
17 combination of said first inner tubular space and said outer tubular outer barrel.
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- 19 19. The method of claim 18 further comprising mounting said second inner tubular to
20 said second end of said tubular outer barrel by heat fusing said second inner tubular
21 spacer to said second end of said tubular outer barrel.
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1 20. The method of claim 16 further comprising inserting at least one of a screen or a
2 section of glass wool material into said second end of said tubular outer barrel prior to or
3 after inserting said sorbent material into said tubular outer barrel.

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